

REMARKS

This is in response to the non-final Office Action mailed on March 16, 2010, in which claims 16, 18, 19, 23-27, 29, and 31-35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of U.S. Patent Pub. No. 2004/0141517 (*Balasubramanian*); and claims 17, 20-22, 28, and 30 were objected to as being allowable but dependent from a rejected base claim. With this Amendment, claims 16-18, 20, 23, 26, 28-30, and 34 are amended, and claims 36-38 are added. Claims 16-38 are pending in the present application.

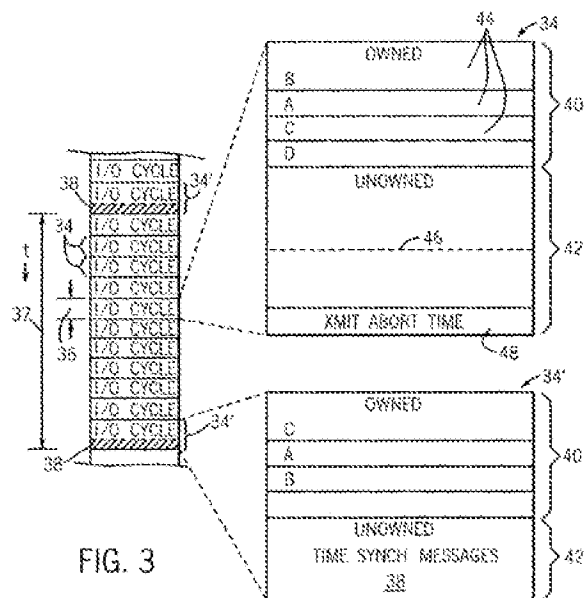
Claim Rejections – 35 U.S.C. § 103

The present application is directed to transmitting data as Ethernet messages from node on an Ethernet network. The data is converted into a plurality of Ethernet messages, and the Ethernet messages are transmitted sequentially, cyclically, and continuously during a cycle having a cycle time. The node is configured to transmit Ethernet messages onto the Ethernet transmission link continuously during the entire cycle time. This avoids having to carry out complex methods for bringing the time base into line between the individual nodes and hence for compensating for communication jitter. *See, e.g.*, paragraphs 011 and 036 of the present application.

To emphasize this continuous transmission feature, claims 16, 26, and 34 are amended to recite that at least one transmission parameter is adjusted to ensure that Ethernet messages are transmitted continuously during an entire cycle time of a cycle. In one described embodiment, the cycle time is adapted, for a prescribed length of the Ethernet messages within the framework of the maximum permissible duration of the cycle in order to output Ethernet messages onto the transmission link continuously during the entire cycle time. *See, e.g.*, paragraph 015 of the present application. In other described embodiments, the number and/or length of the Ethernet messages that are to be sent in a cycle is/are adapted to a prescribed cycle time such that Ethernet messages can be output onto the Ethernet transmission link continuously during the entire prescribed cycle time. *See, e.g.*, paragraph 016 of the present application.

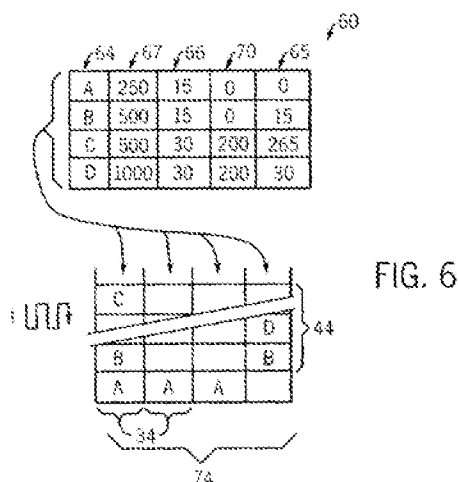
Claims 16, 18, 19, 23-27, 29, and 31-35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicants' Admitted Prior Art (AAPA) in view of *Balasubramanian*. As acknowledged in the Office Action, AAPA does not teach or suggest that the Ethernet messages are transmitted sequentially, cyclically, and continuously during a cycle having a cycle time. In addition, AAPA does not teach or suggest that at least one transmission parameter is adjusted to ensure that Ethernet messages are transmitted continuously during an entire cycle time of a cycle, as required by amended claims 16, 26, and 34.

Balasubramanian does not supply the deficiencies of AAPA. *Balasubramanian* relates to an industrial controller 10 including nodes 12 that communicate via one or more I/O lines 14 on an Ethernet network 11. As shown in FIG. 3 reproduced below, the total information carrying capacity of the network 11 may be divided into a set of segments in time designated as I/O cycles 34. *Balasubramanian*, paragraph 0047. Each I/O cycle 34 is scheduled and is divided into an owned portion 40 and an unowned portion 42. *Balasubramanian*, paragraph 0049. Each owned portion 40 includes a number of frames 44 which are assigned by the schedule to one specific node 12. *Id.*



The schedule, which is downloaded to each node 12 from a schedule coordinating node 12, includes a data structure including node identifiers 64, packet transmission start

time 65, packet length 66, packet frequency 67, and jitter limits 70. *Balasubramanian*, paragraph 0059 and FIG. 6 (reproduced below). The packet transmission start time 65 indicates the absolute time when a packet from a node 12 will be first transmitted, the packet length 66 indicates the transmission time reserved for a packet, and the packet frequency 67 indicates how often each node needs to transmit information. *Id.* In other words, parameters related to transmission time and transmitted message for each node is set by a scheduler, and *Balasubramanian* does not describe adjusting any of the parameters 65, 66, 67, or 70 to ensure that Ethernet messages are transmitted continuously during an entire cycle time of a cycle, as required by claims 16, 26, and 34.



In fact, *Balasubramanian* acknowledges that portions of the owned portion 40 may go unused by a node 12. *Balasubramanian*, paragraph 0050. *Balasubramanian* also states that the unowned portion 42 may include all of the time of the I/O cycle 34 not used by the owned portion 40, but notes that in some cases the unowned portion 42 may be less than the remainder of an I/O cycle 34 (“guaranteed unowned portion 46” in FIG. 3 above), leaving a portion of the I/O cycle unused. In these cases, Ethernet messages are not transmitted continuously for the *entire* cycle time of the I/O cycle 34.

Thus, because *Balasubramanian* also does not teach or suggest that at least one transmission parameter is adjusted to ensure that Ethernet messages are transmitted continuously during an entire cycle time of a cycle, AAPA and *Balasubramanian*, either alone or in combination, do not teach all limitations of amended claims 16, 26, and 34.

Therefore, it is respectfully submitted that the rejection of claims 16, 26, and 34 under 35 U.S.C. § 103(a) be withdrawn.

Claims 18, 19, 23-25, 27, 29, 31-33, and 35 were also rejected under 35 U.S.C. § 103(a) as being unpatentable over AAPA in view of *Balasubramanian*. Claims 18, 19, and 23-25 depend from claim 16, claims 27, 29, and 31-33 depend from claim 26, and claim 35 depends from claim 34. As such these claims are allowable for the same reasons set forth above with respect to their respective dependent claims. In addition, it is respectfully submitted that the combinations of features recited in claims 18, 19, 23-25, 27, 29, 31-33, and 35 are patentable on their own merits, although this does not need to be specifically addressed herein since any claim depending from a patentable independent claim is also patentable.

Allowable Subject Matter

Claims 17, 20-22, 28, and 30 were objected to as being allowable but dependent upon a rejected base claim. Claims 17 and 20-22 depend from claim 16, and claims 28 and 30 depend from claim 26. As discussed above, claims 16 and 26 are in a condition for allowance. Therefore, claims 17, 20-22, 28, and 30 are allowable with their respective allowable independent claims.

New Claims

Claim 36-38 is added with this Amendment. Claim 36 is previously presented claim 22 rewritten in independent form. In that claim 22 was indicated to be allowable, consideration and allowance of new claim 36 are respectfully requested.

Claims 37 and 38 are directed to features disclosed in the specification at, for example, paragraph 19. According to these new independent claims, the real-time application that generates real-time data to be sent as Ethernet messages is synchronized at the node to the transmission operation for the Ethernet messages. This procedure avoids an overflow. *Balasubramanian* discloses a data transmission synchronization (paragraphs 48, 49). However, *Balasubramanian* does not teach a synchronization of the application that

generates the data for the Ethernet messages with the transmission operation. Consideration and allowance of new claims 37 and 38 are respectfully requested.

CONCLUSION

For the reasons explained above, all pending claims are now in condition for allowance. Accordingly, the applicant respectfully requests that the Office issue a Notice of Allowance.

Any amendments to the claims are made to expedite prosecution of this application, without acquiescing to the Office's rejections or characterizations of the claims or references in the Office Action. Even if not expressly discussed above, the applicant respectfully traverses each of the rejections, assertions, and characterizations regarding the disclosure and teachings of the cited references, including the prior art status and the propriety of proposed combinations of cited references.

The Applicant has made a good faith effort to respond to all rejections set forth in the Office Action and to place the pending claims in condition for immediate allowance. If it would be helpful, the Examiner is invited to contact the undersigned at the number listed below to facilitate prosecution of this application.

Respectfully submitted,

FAEGRE & BENSON LLP

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By: /Paul G. Koziol/
Paul G. Koziol
Reg. No. 58,515
612-766-8965
Customer No.: 25764